

The Nymph of *Utacapnia trava* (Nebeker and Gaufin) (Plecoptera: Capniidae)

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Abstract.—The mature nymph of *Utacapnia trava* (Nebeker and Gaufin) is described from specimens collected in Alberta, Canada. Habitus, mouthparts, setal profile and supraanal lobe of the male nymph are illustrated. Underwater thermoregulation by adults is reported.

Species of the winter stonefly genus *Utacapnia* occur primarily in small streams of western North America. The nymphs of four of 10 species have been described in this genus (Nebeker and Gaufin 1965; Harper and Hynes 1971). *Utacapnia trava*, originally described by Nebeker and Gaufin (1965), ranges from Alberta and Saskatchewan to Idaho and Montana (Stark *et al.* 1986). This first nymphal description is based on a collection of 110 nymphs from Battle Creek near Reesor Lake in Cypress Hills, Alberta from which 23 males and 20 females were reared to the adult stage in laboratory aquaria. Specimens have been deposited in the Canadian National Collection, Ottawa and in the authors' personal collections.

Description of Nymph: Total length of mature nymph: 7.2–9.0 mm (excluding antennae and cerci). General colour light to medium brown, venter and appendages lighter. Conspicuous color pattern in very mature nymphs which is an underlying pre-adult pattern (Fig. 1): head with 2 dark spots near posterior ocelli which extend from each ocellus along the ecdysial line nearly to antennae; two dark dots bracket anterior ocellus. Anterior margin of head with 3 dark dots near base of each antenna. Pronotum nearly uniformly dark above, or with darker areas interspersed in a reticulate pattern, but with a darker median line extending laterad at anterior and posterior ends. Meso- and metanota with dark, basal, V-shaped markings. Anterior margins of abdominal segments 1–8 in males with dark medial markings which become wider (approximately $\frac{1}{4}$ the mid-dorsal tergum length) laterally. Subtriangular dark spots below lateral markings; submedian dark dots on abdominal segments 1–7. Male ninth and tenth abdominal terga with no lateral markings; male supraanal lobe as in Fig. 6. Mature females without dark line across anterior margins of abdominal terga; segments 1–7 with subrectangular dark markings on anterolateral segmental

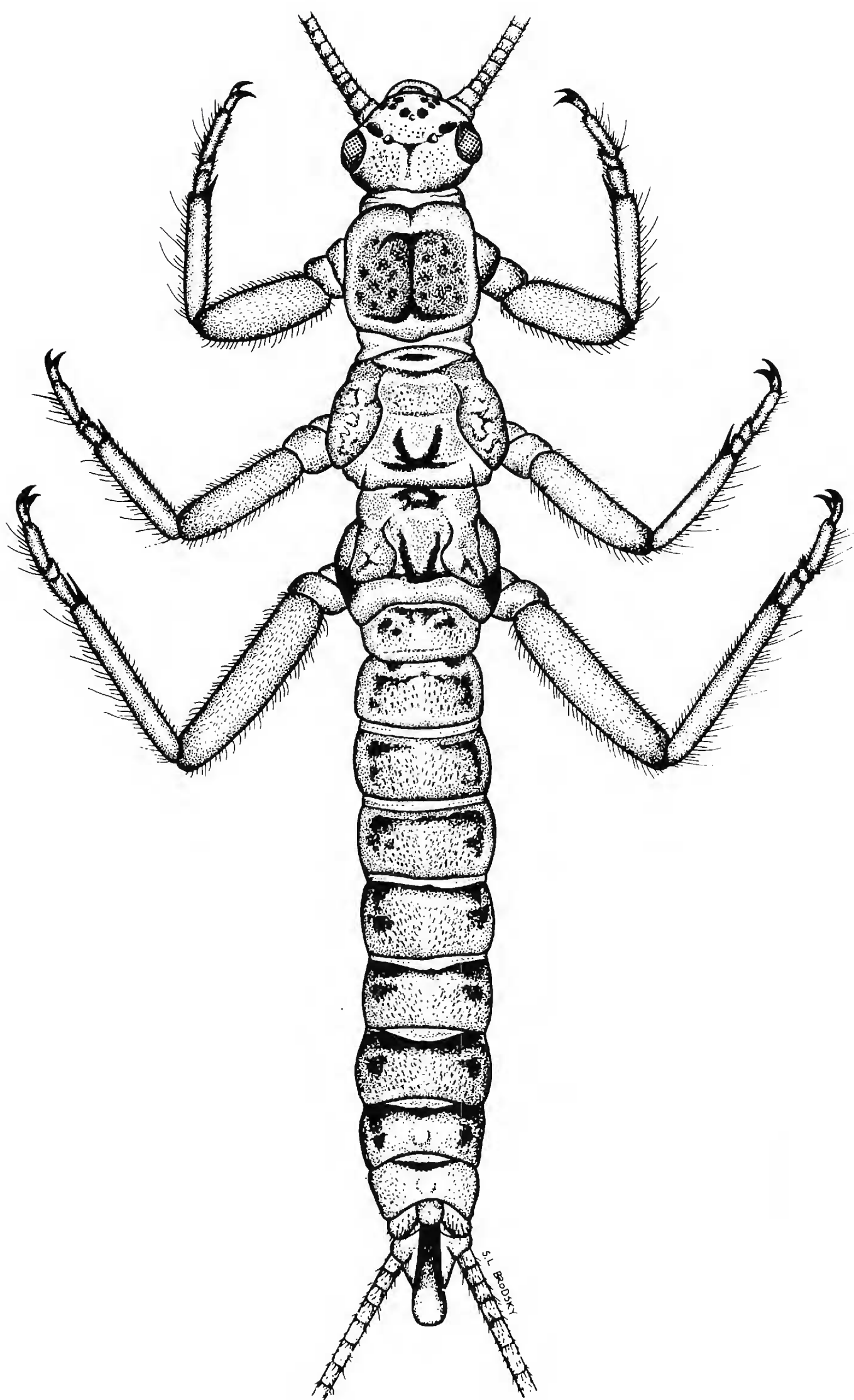
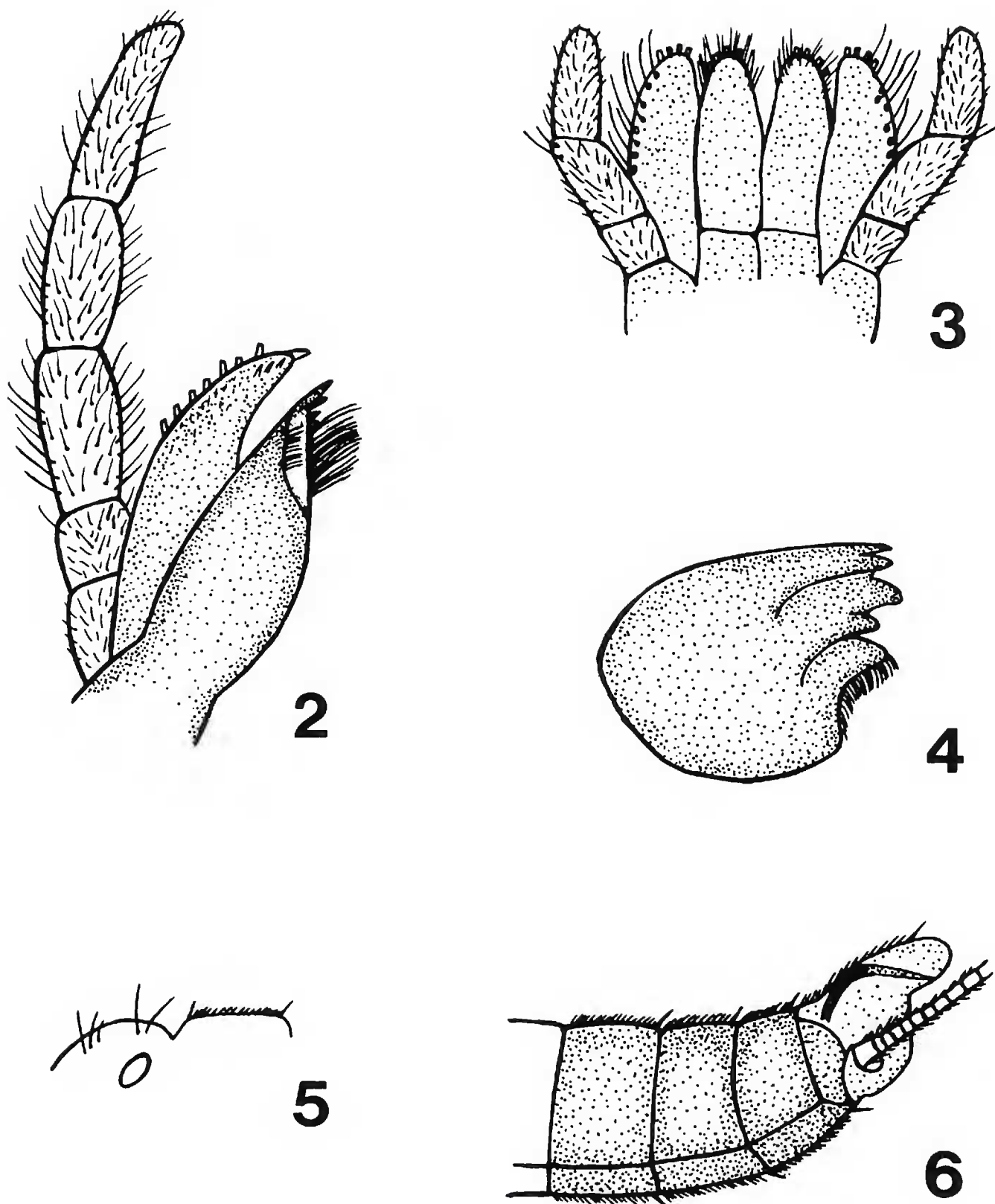


Fig. 1. *Utacapnia trava* mature male nymph, habitus.



Figs. 2–6. Mouthparts, male supraanal lobe and setae of *Utacapnia trava* nymph. 2, maxilla; 3, labium; 4, mandible; 5, setae seen in profile on the top of the head and pronotum; 6, male supraanal lobe and abdominal setae in profile.

margins and a large (about $\frac{1}{2}$ the mid-dorsal length of the tergum) and small (about $\frac{1}{6}$ the mid-dorsal tergum length) subcircular spot beneath each subrectangular marking. Abdominal segments 8–9 with subcircular dark markings only; segment 10 without markings.

Body clothed with short, sparse hairs. Head with longer hairs near eyes and at anterior angle of frons (Fig. 5). Margins of pronotum and posterior margins of tergites with a few short, erect bristles: on abdomen bristles are about $\frac{1}{4}$ the mid-dorsal tergum length (Fig. 6). Legs covered with short bristles; longer hairs on tibiae and tarsi (Fig. 1).

Maxilla (Fig. 2) with slender lacinia and 4 teeth at apex. Twelve to 15 bristles on inner apical margin and 8–10 shorter bristles along a parallel apical ridge. Galea equal in length to lacinia with a single apical spine and 2–3 smaller spines below. Seven peg-like projections along lateral margin of galea. Palpi with last segment longer than penultimate segment. Labium (Fig. 3) with glossae and paraglossae equal in length. Glossae with an apical fringe of short hairs; paraglossae with 8 long hairs along outer lateral margins. Four peg-like projections at tips of glossae and paraglossae. Palpi short with apical and penultimate segments equal in length; apical segment tapering to a blunt point. Mandible (Fig. 4) with 2 sharp outer cusps and one blunt inner cusp. Inner cusp with a fringe of short bristles.

REMARKS

It is presently inadvisable to try to identify generic characteristics because few species have been described, and descriptions by Nebeker and Gaufin (1965) have not included patterns of setation. Potential diagnostic characters to distinguish species may include setal pattern, number of apical teeth on the lacinia of the maxilla and number and arrangement of peg-like projections on the maxilla and labium. Nymphs of *U. trava* differ from descriptions of *Utacapnia columbiana* (Claassen), *Utacapnia lemoniana* (Nebeker and Gaufin) and *Utacapnia poda* (Nebeker and Gaufin) in Nebeker and Gaufin (1965) by the presence of four, rather than three, apical teeth on the lacinia. Nymphs of *Utacapnia labradora* (Ricker), tentatively described by Harper and Hynes (1971), have abdominal bristles nearly as long as the mid-dorsal length of the tergum. In *U. trava* nymphs, these bristles extend only one-quarter the mid-dorsal length.

On the date nymphs were collected (4 March 1986), all ice had disappeared from the stream and water temperature was 2°C. Adults were also present, although not abundant. Due to an unusually early spring, this adult record is considerably earlier than emergence dates reported previously for this species at the same site (Doddall and Lehmkuhl 1979). It is noteworthy that four adult males were collected in stream benthic samples taken with a standard sweep net at an approximate water depth of 25 cm. Furthermore, both males and females were occasionally observed to crawl beneath the water surface of laboratory rearing aquaria (5 ± 1 °C; 12h light : 12h dark) for periods of up to 50 minutes. Tozer (1979) observed similar behavior by adults of *Zapada cinctipes* (Banks) (Nemouridae) and considered it to be a means of thermo-regulation during severe temperatures. Adults of *U. trava* appear to employ the same adaptive strategy to prevent freezing in an environment where air temperatures at emergence time can drop far below freezing (for example, night temperatures of -15° C are common at this time of year), but where water temperatures remain relatively constant and above freezing.

The gut contents of 10 nymphs were examined and found to contain filamentous algae and coarse particles of plant material. This corresponds to general descriptions of members of Capniidae as detritivorous shredders (Harper and Stewart 1984).

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LITERATURE CITED

- Dosdall, L. M. and D. M. Lehmkuhl. 1979. Stoneflies (Plecoptera) of Saskatchewan. *Quaest. Ent.* 15: 3–116.
- Harper, P. P. and H. B. N. Hynes. 1971. The Capniidae of eastern Canada (Insecta; Plecoptera). *Can. J. Zool.* 49: 921–940.
- Harper, P. P. and K. W. Stewart. 1984. Plecoptera, pp. 182–230. *In* Merritt, R. W. and K. W. Cummins (eds.). *An introduction to the aquatic insects of North America* (2nd ed.). Kendall/Hunt Publ. Co., Dubuque, Iowa. 722 pp.
- Nebeker, A. V. and A. R. Gaufin. 1965. The *Capnia columbiana* complex of North America (Capniidae: Plecoptera). *Trans. Amer. Ent. Soc.* 91: 467–487.
- Stark, B. P., Szczytko, S. W. and R. W. Baumann. 1986. North American stoneflies (Plecoptera): systematics, distribution, and taxonomic references. *Great Basin Natural.* 46: 383–397.
- Tozer, W. 1979. Underwater behavioural thermoregulation in the adult stonefly, *Zapada cinctipes*. *Nature* 281: 566–567.